IN THE SPECIFICATION

Page 5, line 18, amend as follows:

combination of these such as a lens series with a discrete set of base curves and a customizable front surface.

4. Outcome Prediction: In this step, the outcome of the intervention is predicted in terms of the wavefront aberration, The predicted wavefront aberration is displayed in a number of ways any one of which can be selected by the surgeon for viewing. Examples of these displays include equivalent spectacle correction, wavefront aberration variance, wavefront aberration contour map, point spread function metrics and displays, modulation transfer function metrics and displays, and simulated retinal images.

5. Predicted Outcome Evaluation: In this step the surgeon uses the various displays of the predict ed outcome wavefront aberration to decide if the outcome would be acceptable for the current case under consideration.

6. Intervention Design Iteration: In this step, the surgeon may continue iterating a modification of the Intervention plan and re-evaluates the predicted outcome until the predicted outcome is judged as acceptable.

7. Perform Intervention: In this step the surgeon performs the intervention.

8. Evaluation of Outcome: In this step the outcome of the intervention is assessed using data such as wavefront aberration exams, uncorrected and best corrected visual acuity, contrast sensitivity test, post-intervention ~~spectacie~~ spectacle correction, etc.

B1

9. **Update Historical Database:** In this step the database of historical visual correction cases is updated to include the current case.

5.

Page 7, lines 17 - 18, amend as follows:

B2

In Figure 2 is shown the cornea and wavefront W positioned along an optical axis. In this Figure 2, the wavefront is located at the entrance pupil of the eye. As shown in Figure 2, if a ray R2 is traced from the fovea, it would appear to exit the eye in the direction of R0. This exiting ray is perpendicular to W as shown by the dotted line intersection with W.

To construct a model consistent with this information an average axial length of 24 mm may be assumed and a ray transfer element (RTE) introduced that maps an incoming ray R2 from the fovea to the intermediate ray R1 so that the exit ray RO has the desired orthogonality relationship with W, as shown in Figure 2.

Construction of the RTE is accomplished using the following steps:

1. For a regular sampling of points on W do the following steps:

2. Construct the ray RO perpendicular to W at the sample point on W;

3. Trace - RO through the system until it intersects the RTE plane;

4. At the RTE intersection point, compute the mapping for the incident and transmitted rays;

and

5. If there are more samples on W go back to step 2.

The optical ray tracing of refractive and reflective elements is well known to those skilled in the art~~, for example as shown in "An Introduction to Ray Tracing," edited by A. S. Glassner, Acedemic Press, Inc. (1991)~~ and for that reason is not described in detail.

Ray Transfer Element

B1

The ray transfer element (RTE) is an important aspect of AVIA. It provides both a means to generate an optical model that is consistent with exam data and a means to adapt the modeling to past surgical procedures so that prediction of postoperative outcomes is improved for future

7.

Page 9, lines 7 - 8, amend as follows:

RTE Construction

B3

In the preferred embodiment, the construction of the RTE is described in local coordinates. In practice, rays defined in world coordinates are first transformed into local coordinates using homogeneous transformation matrices, collectively called a world-to local transformation matrix. Likewise, resulting rays in local coordinates are transformed to world coordinates using an inverse of the previous homogeneous transformation matrix, called local-to-world transformation matrix,

as would be well known to those skilled in the art ~~(See for example, Hearn D. and Baker, M. P., Computer Graphics, Second Edition, Prentice Hall, Inc. (1994) for a discussion of homogeneous transformation matrices.)~~ Since the goal of the RTE is to transform an input ray into an output ray for a given intersection point, we simply construct a mapping for a set of input/output ray pairs. Suppose an incident ray I and a transmitted ray T defined in local Coordinates is given. The intersection point $(x,y,0)$ is denoted S. The plane that contains the optical axis (z-axis) and the point S is called the meridional plane. The plane parallel to the z-axis and perpendicular to the meridion at plane is referred to as the transverse plane. These planes are illustrated in Figure 3. The strategy for finding the mapping of I to T is to find the change in elevation and azimuth angles for the two rays with respect to the meridional and transverse pianos, so that I can be rotated into T. The first step is to compute a meridional plan coordinate basis matrix. For this coordinate system, X' points from S to the origin. Y is 90 deg counter clockwise to X', and Z' is parallel to the original z-axis. These basis vectors are illustrated in Figure 4.

For simplicity of presentation, in the following the prime notation is dropped for the meridional basis vectors X', Y', and Z'. Given S we can compute the meridional coordinate basis